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EXAMINER	
PURINTON, BROOKE J	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,131	ROSENBERG ET AL.	
	Examiner	Art Unit	
	Brooke Purinton	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/28/2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32,35-42,44 and 45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32, 35-42,44-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 December 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Objections

Claims 2, 7, 8, 13, 14, 23, 24, 35, 36, 38, 39, and 44 are objected to because of the following informalities: improper antecedent basis, "relationships" have not been amended to become "distances". For the purposes of examination, examiner will read it as likewise substituted in claims 1, 15, 37 and 42. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-32, 35-42,44-45 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The statistical averaging process claimed in the amended claims is referenced in paragraph 45 and 54 but only in context as an embodiment with multiple reference structural elements, and multiple images. Nowhere in the specification is statistical averaging described, nor is it an implicit embodiment with just one reference structural element and two distances.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 15, 37 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "statistically averaging" in claims 1, 15, 37 and 42 is a relative term which renders the claim indefinite. The term "statistically averaging" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Examiner does not understand how averaging only the two traverse section distances will result in the cross sectional dimension. Also, in applicants paragraph 45, even then it is not statistical averaging, the goal is statistical processing to average out errors, e.g. signal to noise ratio, which is well known in the art. So is the limitation really to average the two distances or to statistically process results to average out errors?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 7, 8, 15-18, 20-24, 35-40, 42, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochi et al. (USPAPN 2002/0179812) and Bareket (6079256).

Regarding Claim 1, Kochi et al. teach a method for determining a cross sectional dimension (a width or height on a substrate) of a measured structural element (specimen 9) having a sub-micron cross section, the cross sectional dimension defining an intermediate section of the measures structural element that is located between first and second traverse sections of the measured structural element (Figure 11, part s310 and page 2, paragraph 14, between the reference marks), the method comprising the steps of: scanning while an inspection tool is in a first tilt state, a first portion of a reference structural element and at least the first traverse section of the measured structural element, to determine a first distance between a certain point of the reference structural element and the first traverse section (Figure 11, part s316); scanning while the inspection tool is in a second tilt state, a second portion of a reference structural element and at least the second traverse section of the measured structural element, to determine a second distance between a certain point of the reference structural element and the second traverse section (Figure 11, part s316 and page 1, paragraph 11 "detecting data three dimensionally means that the electron beam 7 is irradiated to the specimen holder 3 at different, first and second angles and first and second data of the specimen 9 are detected with the electron beam detecting section 4,"); and determining the cross sectional dimension of the intermediate section of the measured structural element in response to the first and second distances (page 1, paragraph 13, "shape measuring section 32 for measuring the shape of the specimen 9 on the basis of the data corrected with the data correcting section 31") wherein the cross sectional dimension is located between a first and second traverse section of the measured structural element (width or height on substrate, par. 14, images that would exist on Figure 4).

Kochi teaches statistically processing images to remove noise ([77-79]) and sharpening the image ([101-106]).

Kochi fails to explicitly teach statistically averaging the first and second distances.

Bareket, when trying to reduce background noise from an observation method, statistically averages together multiple scans (8, 34-45).

Modification would have entailed statistically averaging multiple images (including of course, the information regarding distances) of Kochi together.

It would have been an obvious modification to make since statistically random noise can be corrected for and averaged out.

Regarding Claim 15, Kochi et al. teach a method for determining a cross sectional dimension of a measured structural element having a sub-micron cross section, the cross sectional dimension defining an intermediate section of the measured structural element that is located between first and second traverse sections of the measured structural element, the method comprising the steps of: scanning while an inspection tool is in a first tilt state, at least a first point of a first reference structural element and at least the first traverse section of the measured structural element, to determine a first distance between the first reference structural element and the first traverse section (Figure 11, part s316); scanning while the inspection tool is in a second tilt state, at least a second point of a second reference structural element and at least the second traverse section of the measured structural element, to determine a second distance between the second reference structural element and the second traverse section (Figure 11, part s316 and page 1, paragraph 11); and determining the cross sectional dimension of the intermediate section of the measured structural element wherein the cross sectional dimension is located between a first and second traverse section of the measured structural element (page 1, paragraph 13, "shape measuring section 32 for measuring the shape of the specimen 9 on the basis of the data corrected with the data correcting section 31" – scanned areas around a particular shape).

Kochi teaches statistically processing images to remove noise ([77-79]) and sharpening the image ([101-106]).

Kochi fails to explicitly teach statistically averaging the first and second distances.

Bareket, when trying to reduce background noise from an observation method, statistically averages together multiple scans (8, 34-45).

Modification would have entailed statistically averaging multiple images of Kochi together.

It would have been an obvious modification to make since statistically random noise can be corrected for and averaged out.

Regarding Claim 37, Kochi et al. teach a method for determining a cross sectional dimension of a measured structural element having a sub-micron cross section, the cross sectional dimension defining an intermediate section of the measured structural element that is located between first and second traverse sections of the measured structural element, the method comprising the steps of: scanning while an inspection tool is in a first tilt state, first portions of a set of reference structural elements (reference marks, plural [108]) and at least the first traverse section of the measured structural element, to determine a first set of distances between first certain points of reference structural elements of the set of reference structural elements and the first traverse section (Figure 11, part s316); scanning, while the inspection tool is in a second tilt state, second portions of the set of reference structural elements and at least the second traverse section of the measured structural element, to determine a second set of distances between second certain points of reference structural elements of the set of reference structural elements and the second traverse section (Figure 11, part s316); and determining the cross sectional dimension of the intermediate section of the measured structural element wherein the

cross sectional dimension is located between a first and second traverse section of the measured structural element (page 1, paragraph 13, scanned areas around a particular shape).

Kochi teaches statistically processing images to remove noise ([77-79]) and sharpening the image ([101-106]).

Kochi fails to explicitly teach statistically averaging the first and second distances.

Bareket, when trying to reduce background noise from an observation method, statistically averages together multiple scans (8, 34-45).

Modification would have entailed statistically averaging multiple images of Kochi together.

It would have been an obvious modification to make since statistically random noise can be corrected for and averaged out.

Regarding Claim 42, Kochi et al. teach the system for determining a cross sectional dimension of a structural element having a sub-micron cross section, the cross sectional dimension defining an intermediate section that is located between a first and a second traverse sections of the structural element, the system comprising: means for directing an electron beam towards an inspected object including the structural element so as to scan, at a first tilt state, a reference structural element and at least the first traverse section of the structural element, and to scan at a second tilt state, the reference structural element and at least the second traverse section of the structural element (Figure 3, part 5a) at least one detector that is positioned so as to detect electrons emitted from the structural element as a result of an interaction with the electron beam (Figure 3, part 4); and a processor, coupled to the at least one detector and to the directing means so as to process detection signals received from the at least one detector and to (Figure 3, part 20): determine a first distance between a certain point of the reference structural element and the first traverse section (Figure 11, s322 and [109], [110]); determine a second distance between the certain point of the reference structural element and the second traverse section (Figure 11, part s322 and [109], [110]); and determining the cross sectional dimension of the intermediate section of the measured structural element wherein the cross sectional dimension is located between a first and second traverse section of the measured structural element (page 1, paragraph 13, scanned areas around a particular shape).

Kochi teaches statistically processing images to remove noise ([77-79]) and sharpening the image ([101-106]).

Kochi fails to explicitly teach statistically averaging the first and second distances.

Bareket, when trying to reduce background noise from an observation method, statistically averages together multiple scans (8, 34-45).

Modification would have entailed statistically averaging multiple images of Kochi together.

It would have been an obvious modification since statistically random noise can be corrected for and averaged out.

Claim 2- Kochi et al. and Bareket teach a method of claim 1 wherein the first distance is a distance between the certain point of the reference structural element and a first edge of the measured structural element (Figures 1a-2b, showing the d12 and d23 and corrected deviation after angle images, used to create figure 2b).

Claim 3- Kochi et al. and Bareket teach a method of claim 2 wherein the first edge of the measured structural element and the certain point of the reference structural element are substantially located on a same plane (Figure 4c, point where first edge meets reference structural element 40).

Claim 4 – Kochi et al. and Bareket teach a method of claim 1 wherein a height of the certain point of the reference structural element is much smaller than a height of the measured structural element (Figure 4c, reference template 40 much smaller than 40 a/b measured structural element).

Claim 5- Kochi et al. and Bareket teach a method of claim 1 further comprising a preliminary step of generating the reference structural element at a vicinity of the measured structural element (Figure 11, s310-s316).

Claim 7/23/35 – Kochi et al. and Bareket teach a method of claim 1/15/25 and further teach wherein at least one additional reference structural element is provided at a vicinity of the reference structural element and wherein the steps of scanning further comprise scanning the at least one additional reference structural element to provide a third distance, in addition to the first and second distances, between the at least one additional reference structural element and a traverse section of the measured structural element (reference marks [108], where all are scanned).

Claim 8/24/36 - Kochi et al. and Bareket teach the method of claim 7/23/35, wherein the step of determining is further responsive to the third distance ([109] "calculates... from the reference marks detected").

Claim 16/40- Kochi et al. and Bareket teach the method of claim 15/37, wherein the reference structural element is positioned on both sides of the measured structural element (Figure 4).

Claim 17- Kochi et al. and Bareket teach the method of claim 15 further comprising a step of measuring a distance between the first and second points ([64]).

Claim 18- Kochi et al. and Bareket teach the method of claim 17 wherein the measured structural element is positioned between the first and second reference structural elements and wherein the step of measuring the distance comprises performing at least one scan of the first and second points and the measured structural element (Figure 4, Figure 11)

Claim 20- Kochi et al. and Bareket teach method of claim 15 wherein the structural element is line that has a top section and two substantially opposing sidewalls (semiconductor pattern [58]).

Claim 21 - Kochi et al. and Bareket teach the method of claim 15 wherein the structural element is a contact (semiconductor pattern [58]).

Claim 22 – Takane et al. teach the method of claim 15 wherein the structural element is a recess (semiconductor pattern [58]).

Claim 38 – Kochi et al. and Bareket teach the method of claim 37 wherein the step of determining comprises statistical processing of the distances of the first set to provide a first distance (pages 7-9, mathematical steps, relating image processing, parameter calculating to provide distances among points).

Claim 39-Kochi et al. and Bareket teach the method of claim 37 wherein the step of determining comprises statistical processing of the distances of the second set to provide a second distance (pages 7-9, mathematical steps, relating image processing, parameter calculating to provide distances among points).

Claim 44- Kochi et al. and Bareket teach the system of claim 42 wherein the processor is capable of determining the cross sectional dimension in response to additional distances between the measured element and additional reference structural elements (shape measuring section 32, page 2, paragraph 23).

Claims 6, 9-14, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochi et al. (USPAPN 2002/0179812) and Bareket as applied to claims above and further in view of Takane et al. (USPAPN 2003/0010914).

Claim 6 – Kochi et al. and Bareket teach a method according to claim 1.

They fail to teach wherein during the first tilt stage a measurement angle defined between a measured object that includes the measured structural element and an electron beam that scans the measured structural element is substantially ninety degrees.

Takane et al. teach a first scan of an electron beam that scans the measured structural element at a 90 degree angle (Figure 3 and Figure 11).

It is known in the art to scan at ninety degrees and will still give information about the distance between measured and reference structural element, therefore, it would be obvious to try. Scanning a beam at a 90 degree angle to the reference structural element would yield the predictable results of garnering more information about the specimen and any measured structural elements.

Claim 9/25/45 – Kochi et al. and Bareket teach the method of Claim 7/15/42.

Kochi et al. are silent on determining whether to perform additional scanning.

Takane et al. teach wherein after scanning, while the inspection tool is in the first tilt state determining whether to perform additional scanning (Page 5, paragraphs 72-73 and Figure 10, part 1004).

Modification would have entailed using the technique of Takane et al. in the method of Kochi et al. to stop scanning after any scan period.

It would have been obvious to one of ordinary skill in the art at the time of the invention to make such a medication since it would enable an operator to stop the scan whenever necessary(for instance, if the electron beam was malfunctioning, if the focus was off, if there was the wrong wafer in the holder, if the reference structural elements were not made or if the first scan provided all the information needed) without wasting time while waiting for all the scans at various tilt angles to be completed.

Claim 10-Kochi et al. and Takane et al. teach the method of claim 9 wherein performing the scanning, Takane further teaches while the inspection tool is in the second tilt state, is in response to determining a feature of the first traverse section (Figure 10, part 1004).

Claim 11 Kochi et al. and Takane et al. teach the method of claim 10, Takane further teaches wherein the feature is an estimated width or an estimated orientation of the first traverse section ("protrusion/depression" (1,9)).

Claim 12- Kochi et al. and Takane et al. teach the method of claim 11, Takane et al. further teach wherein the orientation is estimated by comparing detection signals generated as a result of a scan of the first traverse section and detection signals generated as a result of at least one scan of another traverse section of known width (page 1, paragraph 8).

Claim 13- Kochi et al. and Takane et al. teach the method of claim 9, Kochi et al. further teach wherein at least one additional reference structural element is provided at a vicinity of the reference structural element and wherein the steps of scanning further comprise scanning the at least one additional reference structural element to provide a third distance, in addition to the first and second distances, between the at least one additional reference structural element and a traverse section of the measured structural element ([108-109]).

Claim 14- Kochi et al. and Takane et al. teach the method of claim 13.

In the combination of the two inventions, it would have been obvious wherein the step of determining is further responsive to the at least one additional third distance, for the same reasons as given in Claim 9.

Claim 26 – Kochi et al. and Bareket teach the method of claim 25.

They fail to explicitly teach wherein the scanning, while the inspection tool is in the first tilt state, comprises scanning with an electron beam that is substantially perpendicular to a measured object that includes the measured structural element

Takane et al. teach wherein the scanning, while the inspection tool is in the first tilt state, comprises scanning with an electron beam that is substantially perpendicular to a measured object that includes the measured structural element (Figures 3 and Figure 10, page 1, paragraph 8).

It is known in the art to scan at ninety degrees and will still give information about the distance between measured and reference structural element, therefore, it would be obvious to try. Scanning a beam at a 90 degree angle to the reference structural element would yield the predictable results of garnering more information about the specimen and any measured structural elements.

Claim 28 – Kochi et al. and Bareket teach the method of claim 25.

They fail to explicitly teach wherein the determination of whether additional scanning is required is responsive to an estimated orientation of a traverse section (Figure 10, depression/protrusion determination step 1004/1008).

Takane et al. teach wherein the determination of whether additional scanning is required is responsive to an estimated orientation of a traverse section (Figure 10, depression/protrusion determination step 1004/1008).

Modification would have entailed using the technique of Takane et al. in the method of Kochi et al. to stop scanning after any scan period dependent on the orientation of a traverse section.

It would have been obvious to one of ordinary skill in the art at the time of the invention to make such a medication since it would enable an operator to stop the scan whenever necessary(for instance, if the electron beam was malfunctioning, if the focus was off, if there was the wrong wafer in the holder, if the reference structural elements were not made or if the first scan provided all the information needed) without wasting time while waiting for all the scans at various tilt angles to be completed. Orientation could detail whether the wafer being scanned has a defect that renders it unusable in the future, and thus, pointless to examine now, or for various other reasons.

Claims 19, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochi et al. and Bareket.

Claim 19- Kochi et al. and Bareket teach the method of claim 18.

He fails to teach wherein the at least one scan comprises preventing the electron beam to illuminate the measured structural element.

It would have been obvious to one of ordinary skill to skip the measured structural element if the element had a width that was excessively wide and therefore not waste time observing it, since the objective in that case might have been to simply understand if it was protruding or recessing into the reference structural element. Not illuminating the measured structural element would have yielded the predictable results of saving time when coordinates of the traverse sections are already known.

Claim 41 – Kochi et al. and Bareket teach the method of claim 37, wherein the set of reference structural elements is positioned at a side of the measured structural element (Figure 4a,4b and [105]). It would have been obvious to one of ordinary skill to use these reference points created in any way necessary to best complete the scanning and etection that goes along with it "to judge whether the position and number of the feature points are sufficient ... after dividing the image into segments," [105] meaning that the reference mark position is a design choice based need and/or knowledge of surface to be judged. Therefore, it would be obvious to tailor the reference elements to what was needed, and placing the reference structural elements on one side would be an implicit embodiment.

Claims 27 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochi et al. and Bareket as applied to claims above and further in view of Muckenhirn (USPAPN 2003/0168594)

Claims 27 and 29-32 are rendered obvious by the fact that Kochi et al. and Bareket teach the method of claim 25, further teaching wherein the determination of whether to perform additional scans is responsive to an estimated orientation of a traverse section.

Kochi et al. fail to teach wherein the determination of whether to additional scanning is required is responsive to an estimated width of a traverse section, cross sectional dimension, or a threshold including a maximum or minimum width needed.

Muckenhirn teaches a surface analyzing system wherein the determination of whether to perform additional scans is responsive to an estimated width of a traverse section, cross sectional feature, or a threshold including a maximum or minimum width needed (Figure 4, part 416).

One of ordinary skill in the art could have pursued the width dependent observation method of Muckenhirn in order to avoid wasting time or slowing down inspection processes with for example, measured structural elements that are too wide to move along in a manufacturing base, or protrusions, perhaps wires, that are too thin to be operable (Muckenhirn, page 1, paragraph 3).

There would have been a reasonable expectation of success since the observational data garnered from single tilt and multi-tilt images would have allowed a realization of the important characteristics of the wafer, and therefore, the capability to stop processing or continue processing as necessary if the semiconductor characteristics are unsuitable.

Response to Arguments

Applicant's arguments filed 10/28/2009 have been fully considered but they are not persuasive.

Regarding Applicants argument that theres no determination of a cross sectional dimension between first and second traverse sections. Consider Kochi's figure 4c as an example of a surface under examination. Kochi will be using a reference mark to make multiple scans of this. Each side of the heightened pyramid, that is, that on the middle step, are scanned. Those respectively would be first and second traverse sections. Since Kochi is also finding the entire shape (e.g. see 2d to 3d discussion in the last office actions response to arguments), then it will be using the knowledge of any traverse sections, as well as the various heights and reference marks, to recreate the surface, and implicitly measuring the cross sectional dimension. "Traverse sections" has been taken in the broadest reasonable interpretation, as well as in the context of the specification, but without reading limitations into the phrase. Traverse sections are not limited to being the slanted edges of a structure on a substrate, as pictured in the applications drawings.

Additinoally, note that Takane also superimposing images to decrease the S/N ratio (paragraph 43), which is very close to the processing that Bareket performs, although Takane does not explicitly state that it is statistically average the images.

Conclusion

Cited prior art mostly deals with statistical averaging, and shows averaging images in various areas.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brooke Purinton whose telephone number is 571.270.5384. The examiner can normally be reached on Monday - Friday 7h30-5h00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571.272.2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. P./
Examiner, Art Unit 2881
Brooke Purinton
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/ROBERT KIM/
Supervisory Patent Examiner, Art Unit 2881